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PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Applicants: Coffman et al.

Examiner: A. Armstrong

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Group Art Unit: 2654

Filed: August 13, 1999

Docket: YO999-276 (8728-299)

For: **METHOD FOR DETERMINING AND MAINTAINING
DIALOG FOCUS IN A CONVERSATIONAL SPEECH SYSTEM**

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APPEAL BRIEF

Appeal from Group 2654

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I. INTRODUCTION

This Appeal is from a Final Office Action mailed on May 28, 2003 (Paper No.16), finally rejecting claims 1-25 of the above-identified application, and an Advisory Action mailed on August 22, 2003 (Paper No. 18). Applicants commenced this Appeal by a Notice of Appeal that was filed on September 8, 2003, and hereby submit this Appeal Brief.

II. REAL PARTY IN INTEREST

The real party in interest for the above-identified application is International Business Machines (IBM) Corporation, the assignee of the entire right, title and interest in and to the subject application by virtue of an assignment of record in the U.S. Patent and Trademark Office.

III. RELATED APPEALS AND INTERFERENCES

There are no Appeals or Interferences known to Applicant, Applicant's representatives or the Assignee, which would directly affect or be indirectly affected by or have a bearing on the Board's decision in the pending Appeal.

IV. STATUS OF CLAIMS

Claims 1-25 are pending, stand rejected and are under appeal. The claims on appeal are set forth in the attached Appendix.

Claims 1, 10 and 19 are independent claims. Claims 2-9 depend directly or indirectly from claim 1. Claims 11-18 depend directly or indirectly from claim 10. Claims 20-25 depend directly or indirectly from claim 19.

V. STATUS OF AMENDMENTS

No after final Amendments were filed in this case subsequent to the Final Office Action of May 28, 2003 (Paper No. 16).

VI. SUMMARY OF THE INVENTION

In general, the claimed inventions are directed to dialog management systems and methods for conversational computer systems with multiple input modalities. More specifically, the present invention relates to the management of multiple applications and input modalities through a conversational system, wherein many applications can be active at any time and the intended object of a user's action or command (dialog focus) can be deduced via focus resolution through an examination of the context of the user's command. The command may be entered through any one of the several input modalities, examples of which include a spoken input, a keyboard input, a mouse input, etc. A detailed multi-modal history of events is maintained for, e.g., system events or commands that a user has previously performed and the final resolution of dialog focus will proceed through knowledge of any application specific aspects of the command and an investigation of the multimodal history.

More specifically, the inventions of claims 1, 10 and 19 will be further discussed with detail to the exemplary diagrams 1-4 of Applicants' Specification for purposes of illustration, but nothing herein shall be construed as placing any limitation on the claimed inventions. Claim 20 is directed to a system for determining and maintaining dialog focus in a conversational speech system. As depicted in the exemplary embodiment of Fig. 1 of Applicants' specification, the system (8) comprises a dialog manager (14) that is adapted to receive commands (12) from a user. As shown in Fig. 3, the dialog manager (14) maintains a current dialog focus (32) for one of a plurality of active applications and a list of expected responses (34) for determining a current context of the commands received.

The system (8) further comprises a multi-modal history (16) coupled to the dialog manager (14). The multi-modal history (16) provides a mechanism for capturing and

maintaining a complete history of all events concerning the system (8), and plays a role in deducing a target (18) of a user spoken command or response (12). As depicted in the exemplary embodiment of Fig. 2, the multi-modal history (16) maintains an event list of all events which affected a state of the system (8). The multi-modal history (16) is adapted to provide input to the dialog manager (14) for determining the current context of the commands (12) received. As depicted in Fig. 2, the events in the multi-modal history (16) include change of dialog focus events, for example.

The system (8) further comprises a control component (20) which is adapted to select at least one method that is responsive to the commands received such that the system (8) applies methods responsive to the commands for an appropriate application including one of the active applications. Further, as specifically recited in claims 1 and 10, the application associated with the command is one of a plurality of active applications that are unknown to the dialog manager (14). In other words, by way of example, as explained on page 14, lines 1-14 of Applicants' specification, the component control (20) maintains a reference to all currently active applications. The dialog manager (14) may, for example, determine that the target (18) application is a calendar application, but the dialog manager (14) has no knowledge of which particular application implements a calendar. This degree of abstraction permits a suite of applications currently active to be modified dynamically, at the user's discretion, with no modification to the dialog manager (14) required.

VII. ISSUES AND REJECTIONS

Pending claims 1-25 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,748,974 to Johnson in view of U.S. Patent No. 5,805,775 to Eberman et al, and in further view of U.S. Patent No. 5,265,014 to Haddock.

Thus, the issue on appeal is whether the combination of Johnson, Eberman and Haddock is legally sufficient to establish a *prima facie* case of obviousness against claims 1-25.

VIII. GROUPING OF CLAIMS

Each Claim 1-25 stands or falls by itself.

IX. ARGUMENTS

A. The Combination of Johnson, Eberman and Haddock is Legally Deficient to Establish a *Prima Facie* Case Of Obviousness Against the Claimed Inventions

In rejecting claims under 35 U.S.C. 103, the Examiner bears the initial burden of presenting a *prima facie* case of obviousness. In re Rijckaert, 9 F.3d 1531, 1532 (Fed. Cir. 1993). The burden of presenting a *prima facie* case of obviousness is only satisfied by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references. In re Fine, 837 F.2d 1071, 1074 (Fed. Cir. 1988). A *prima facie* case of obviousness is established when the teachings of the prior art itself would appear to have suggested the claimed subject matter to one of ordinary skill in the art. In re Bell, 991 F.2d 781, 782 (Fed. Cir. 1993). The suggestion to

combine the references should come from the prior art, and the Examiner cannot use hindsight gleaned from the invention itself to pick and choose among related disclosures in the prior art to arrive at the claimed invention. In re Fine, 837 F.2d at 1075. If the Examiner fails to establish a prima facie case, the rejection is improper and must be overturned. In re Rijckaert, 9 F.3d at 1532 (citing In re Fine, 837 F.2d at 1074).

Here, it is respectfully submitted that at the very minimum, the combination of Johnson, Eberman and Haddock is legally deficient to establish a *prima facie* case of obviousness under 35 U.S.C. 103 to support the rejection of claims 1, 10 and 19. Indeed, it is respectfully submitted that the obviousness rejections are based on impermissible hindsight reasoning through selective teachings of Johnson, Eberman and Haddock, and that no motivation has been shown for justifying the combination of such teachings as against claims 1, 10 and 19. Indeed, at the very minimum, Applicants respectfully submit that such combination does not teach or suggest *a dialog manager using a multi-modal history for determining the current context of a command received, wherein the command is associated with one of a plurality of active applications*, as essentially claimed in claims 1, 10 and 19, much less *wherein the events in the multi-modal history include change of dialog focus events*, as essentially claimed in claim 19.

In the Final Office Action, Examiner acknowledges that Johnson does not disclose *the application associated with the command being one of a plurality of active applications*. In an attempt to cure the deficiencies of Johnson, Examiner cites Eberman as disclosing *an application user interface which allows the user to control the activities of multiple applications ...* “. Examiner then presumably acknowledges that neither Johnson nor Eberman discloses *the dialog manager determining current context of the command by reviewing a multi-modal history of*

events, but relies on Haddock as disclosing a multi-modal user interface for removing referential ambiguity from a natural language input.

Although Eberman arguably discloses multiple applications, Eberman does not disclose or suggest *a dialog manager using a multi-modal history for determining the current context of a command received, wherein the command is associated with one of a plurality of active applications*, In fact, Eberman discloses a mechanism wherein each application registers a set of rules, wherein portions of input texts that are recognized as corresponding to text of the rules are used to determine which commands for a given application to execute (see, e.g., Col. 5, lines 60-65). Thus, the Eberman system is limited in that the *current context of a command received* is determined by matching input text of a user to text of the registered. Eberman does not disclose a mechanism for resolving ambiguities, and input commands must match the texts of the rules.

Furthermore, Haddock does not cure the deficiencies of Johnson and Eberman. In fact, the Examiner has not provided sufficient motivation for combining the teachings of Haddock with the teaching of Johnson and Eberman to support the contention that such combination teaches *using a multi-modal history to determining the current context of a command received, wherein the command is associated with one of a plurality of active applications*, as essentially claimed in claims 1, 10 and 19.

On page 4 of the Office Action, it is contended that “it would have been obvious to one of ordinary skill at the time of the invention to modify Johnson to implement determining current context of user input response by reviewing a history of events as suggested by Haddock, for the purpose of providing a user friendly way to resolve ambiguity in a natural language system.” It is respectfully submitted that such basis for obviousness is legally deficient and misses the point.

To begin, Haddock clearly does not cure the deficiencies of Johnson and Eberman with regard to disclosing or suggesting a dialog manager *using a multi-modal history to determining the current context of a command received, wherein the command is associated with one of a plurality of active applications*, as essentially claimed in claims 1, 10 and 19. Haddock discloses nothing more than a user interface that enables natural language communication between a user and a computer database (single application, not multiple applications) by providing a mechanism for a user to remove a referential ambiguity from a database query by pointing to a textual reference on a visual display (see, e.g., Col. 2, lines 50-58). For example, as depicted in Fig. 2, a display screen has a “history” portion which displays previous questions and responses with respect to user database queries, allowing the user to point to any number of elements in one or more previous responses to which he/she intends to refer, to thereby provide a referential input along for a next database query (see, e.g., Col. 3, lines 1-30).

Those of ordinary skill in the art would readily appreciate that the “history” of previous questions or response for database queries as disclosed by Haddock is not remotely equivalent to a “multi-modal history” of events a multi-modal history that maintains an “event list” of all events which affected a state of the system, wherein the events in the multi-modal history include change of dialog focus events, as claimed in claim 10 for example. In fact, since Haddock does not disclose or suggest multiple active applications, the “history” of Haddock clearly does not include “change of dialog focus events”, for example.

In particular, by way of example, even assuming *arguendo*, that the query cards disclosed by Haddock comprises a “history of events” as contended by Examiner, the Haddock system relies on manual user interaction with such “history” and actual human intelligence processing on part of the user to resolve an ambiguity of a command. This has no relation to the claimed

process of determining by a dialog manager the current context of a command by reviewing a history of events, wherein the current command is associated with one of a plurality of active application, as essentially claimed in claims 1, 10 and 19

Furthermore, Haddock is limited to a single active application (a database application). As such, Haddock does not disclose or remotely suggest method for determining current context of commands between multiple active applications. In fact, Haddock provides no teaching of any mechanism for using *a multi-modal history to determining the current context of a command received, wherein the command is associated with one of a plurality of active applications*, as essentially claimed in claims 1, 10 and 19.

Furthermore, with respect to claim 19, given that Haddock discloses user interaction with a single database application, Examiner cannot reasonably contend that Haddock teaches or even remotely suggests *wherein the events in the multi-modal history include change of dialog focus events*, as essentially claimed in claim 19. Indeed, although Haddock arguably discloses maintaining previous queries, there is nothing in Haddock that remotely suggests a history of events including change of dialog focus events - indeed, with one active application, there is never a change in dialog focus to a different application.

Furthermore, with respect to claims 4, 5, 13, 14, 22 and 23, for example, the cited combination of references clearly does not disclose or suggest *wherein the multi-modal history includes a linked list of all events*, much less *wherein the events in the multi-modal history include at least one of events linked by time, by type, by transaction, by class and by dialog focus*. Indeed, as depicted in Fig. 2 of Applicants' Specification, a linked list of events (22) includes events that are linked by time, event type (28), transaction identifiers, and event class (30). As shown in Fig. 1, a link manager (15) in the multi-modal history (15) returns events of

certain types depending on context. Examiner's reliance on Haddock (see, page 6 of the Final Office Action, for example) as disclosing these claims features is clearly misplaced. Again, although Haddock may maintain a "history" of previous queries, Haddock does not teach or suggest that such "events" are "linked" as contemplated by the invention. In fact, in the Haddock system, because there is no automated context resolution, there is no need for linking "events" because they merely have to be "displayed" for manual selection by the user.

Thus, for at least the above reasons, claims 1, 10 and 19 are believed to be patentable and non-obvious over the combination of Johnson, Eberman and Haddock. Further, all dependent claims are believed to be nonobvious and patentable over such combination at least for the reasons given above for respective base claims 1, 10 and 19.

Accordingly, reversal of the claim rejections under 35 U.S.C. 103(a) is respectfully requested.

B. CONCLUSION

Accordingly, it is respectfully requested that the Board reverse the claim rejections under 35 U.S.C. § 103(a).

Respectfully submitted,


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APPENDIX A

1. A method for determining and maintaining dialog focus in a conversational speech system comprising the steps of:
 - presenting a command associated with an application to a dialog manager, the application associated with the command being one of a plurality of active applications that are unknown to the dialog manager;
 - the dialog manager determining a current context of the command by reviewing a multi-modal history of events;
 - determining at least one method responsive to the command based on the current context;
 - executing the at least one method responsive to the command associated with the application; and
 - changing dialog focus to one of the active applications based on user interaction with the conversational system.
2. The method as recited in claim 1, wherein the step of presenting a command includes the step of employing at least one multi-modal device for presenting the command.
3. The method as recited in claim 2, wherein the at least one multi-modal device for presenting the command includes one of a telephone, a computer, and a personal digital assistant.
4. The method as recited in claim 1, wherein the step of determining a current context of the command by reviewing a multi-modal history of events includes the step of providing a linked list of all events in the multi-modal history.
5. The method as recited in claim 4, wherein the events in the multi-modal history includes at least one of events linked by time, by type, by transaction, by class and by dialog focus.
6. The method as recited in claim 1, wherein the step of determining at least one method includes the step of referencing all active applications using a component control to

determine the at least one method which is appropriate based on the current context of the command.

7. The method as recited in claim 1, wherein the command is presented in a formal language such that a plurality of human utterances represent an action to be taken.

8. The method as recited in claim 1, wherein the step of determining a current context of the command by reviewing a multi-modal history of events includes the step of maintaining a current dialog focus and a list of expected responses in the dialog manager to provide a reference for determining the current context.

9. The method as recited in claim 1, further comprising the step of querying a user for one of information needed to resolve the current context and information needed to take an appropriate action.

10. A program storage device readable by machine, tangibly embodying a program of instructions executable by the machine to perform method steps for determining and maintaining dialog focus in a conversational speech system, the method steps comprising:

presenting a command associated with an application to a dialog manager, the application associated with the command being one of a plurality of active applications that are unknown to the dialog manager;

the dialog manager determining a current context of the command by reviewing a multi-modal history of events;

determining at least one method responsive to the command based on the current context;

executing the at least one method responsive to the command associated with the application; and

changing dialog focus to one of the active applications based on user interaction with the conversational system.

11. The program storage device as recited in claim 10, wherein the step of presenting a command includes the step of employing at least one multi-modal device for presenting the command.

12. The program storage device as recited in claim 11, wherein the at least one multi-modal device for presenting the command includes one of a telephone, a computer, and a personal digital assistant.

13. The program storage device as recited in claim 10, wherein the step of determining a current context of the command by reviewing a multi-modal history of events includes the step of providing a linked list of all events in the multi-modal history.

14. The program storage device as recited in claim 13, wherein the events in the multi-modal history include at least one of events linked by time, by type, by transaction, by class and by dialog focus.

15. The program storage device as recited in claim 10, wherein the step of determining at least one method includes the step of referencing all active applications using a component control to determine the at least one method which is appropriate based on the current context of the command.

16. The program storage device as recited in claim 10, wherein the command is presented in a formal language such that a plurality of human utterances represent an action to be taken.

17. The program storage device as recited in claim 10, wherein the step of determining a current context of the command by reviewing a multi-modal history of events includes the step of maintaining a dialog focus and a list of expected responses in the dialog manager to provide a reference for determining the current context.

18. The program storage device as recited in claim 10, further comprising the step of querying a user for one of information needed to resolve the current context and information needed to take an appropriate action.

19. A system for determining and maintaining dialog focus in a conversational speech system comprising:

a dialog manager adapted to receive commands from a user, the dialog manager maintaining a current dialog focus for one of a plurality of active applications and a list of expected responses for determining a current context of the commands received;

a multi-modal history coupled to the dialog manager for maintaining an event list of all events which affected a state of the system, the multi-modal history adapted to provide input to the dialog manager for determining the current context of the commands received, wherein the events in the multi-modal history include change of dialog focus events; and

a control component adapted to select at least one method responsive to the commands received such that the system applies methods responsive to the commands for an appropriate application including one of the active applications.

20. The system as recited in claim 19, wherein the appropriate application further includes one of an inactive application, an application with a graphical component and an application with other than a graphical component.

21. The system as recited in claim 19, wherein the commands are input to the dialog manager by one of a telephone, a computer, and a personal digital assistant.

22. The system as recited in claim 19, wherein the multi-modal history includes a linked list of all events to associate a given command to the appropriate application.

23. The system as recited in claim 22, wherein the events in the multi-modal history include at least one of events linked by time, by type, by transaction, by class and by dialog focus.

24. The system as recited in claim 19, wherein the control component references all active applications to determine the at least one method which is appropriate based on the current context of the commands.

25. The system as recited in claim 19, wherein the command is presented in a formal language such that a plurality of human utterances represent an action to be taken.